

**tyco**Fire & Building  
Products

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# The Station House

A News Letter for AHJ's,

Fire Sprinkler Contractors &amp; Underwriters

## Fire Sprinkler History - NFSA, NFPA & Tyco



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- **NFSA Celebrates 100 Year Anniversary**
- **Fire Sprinkler Industry History**
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On November 22, **1905**, John Moore of General Fire Extinguishing Company, W.G. Allen of Niagara Sprinkler Company, and George M. Myers of Standard Fire Extinguishing Company, without the benefit of today's modern air travel, met and formed the National Automatic Sprinkler Contractors Association, later to become the National Fire Sprinkler Association. From its inception, the names Grinnell (now the Gem product line), Star, and Central, have been forever intertwined with the history and development of the Association.

The year **2005** finds the NFSA involved in all aspects of the industry. From code initiatives to educational seminars, its activities are highly visible throughout the industry. The organization has successfully transformed the Association into an extremely visible and influential voice for the NFSA's contractor, supplier, and manufacturer members. The evolutionary process of the association is tied directly to the history of its members, and the names of Central, Gem, and Star have played a prominent role ...

### The 1800's - A Time of Need and the Emergence of Leaders

Look through the time machine to the year **1806** - ninety nine years before the historic meeting of the three companies in St. Louis, and we find John Carey filing a patent in London for a perforated pipe concept for fire protection systems. The system never gained acceptance in the United States, but, in **1806**, the country was still in development following its War of Independence. In **1809**, William Cosgrove of London patented an improvement to the system that used 190°F rated fusible link actuators, an outside control valve, and a fire department connection.

The New England States led the nation's industrial progress, and mills (and fires) were common. Records in the United States show that the first 'sprinkler' system (using the perforated pipe method) was installed in the picking room of the Suffolk Manufacturing Company in Lowell, Massachusetts. Responding to continued concerns, the Providence Steam and Gas Company, later to become the Grinnell Company, was founded in **1850**, and it took the lead in fire protection installations for the New England mills with perforated pipe installations. Several improvements were made to the original perforated pipe installations, including those of James B. Francis, who spaced 1/10 inch holes at 9 ft. intervals, and who later experimented with sprinklers, using cords and gutta percha (a gummy, stringy substance that was also used in golf balls) to actuate the devices.



Parmelee Sprinkler, 1874





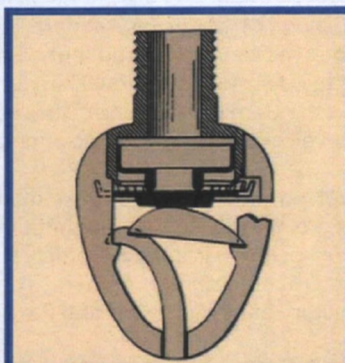
## History of Sprinkler Systems

In **1860**, Barnabas Wood of Nashville, Tennessee patented the first basic sprinkler. The Wood sprinkler included a eutectic fusible solder link – a foundation for sprinklers. The operating temperature of the sprinkler was 165 °F, and this operating temperature is still a standard for solder link sprinklers.

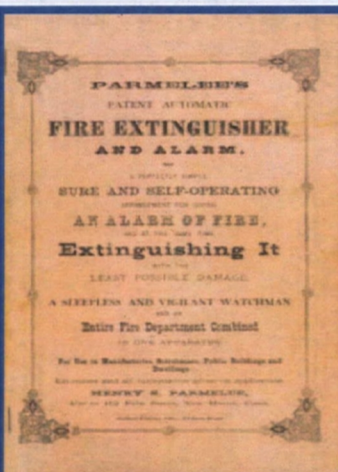
### Parmelee and Grinnell – Names Forever Linked

In **1864**, Henry Parmelee produced his first automatic sprinkler. Five years later, in **1869**, Frederick Grinnell purchased controlling interest in Providence Steam and Gas. The names of Grinnell and Parmelee, through their common interest in fire protection, were to become linked in a matter of a few years.

Frederick Grinnell had an interest in fire protection and worked with James Francis of Lowell, Massachusetts using perforated piping systems for fire protection. After patenting the first 'practical automatic sprinkler' in **1874**, Henry Parmelee installed it on a combined heating and fire protection system in his Mathushek Piano Manufacturing plant in New Haven, Connecticut. Parmelee drew a second patent in **1875** for a design that incorporated a cap that was held in place by solder, covering a perforated distributor (deflector in today's sprinklers). The sprinklers under this design were purchased by Thomas J. Borden for two of his Fall River, Massachusetts mills. With some success encountered, Parmelee began designing and installing sprinkler systems for others. The fact that in those early years, installations were not being driven by code mandates or insurance savings, indicates that there were genuine concerns about controlling fires and saving property and lives.



Original Grinnell



Parmelee Patent

In **1878**, the same year that Frederick Grinnell patented a perforated "sprinkler tube", he entered into an agreement with Henry Parmelee to manufacture the Parmelee sprinklers on a royalty basis. That same year, Parmelee patented a fifth sprinkler design that featured improved sensitivity and a more uniform discharge pattern. Thousands of these sprinklers would be installed over the next three years. As the numbers of installations grew, so did the reputation for effectiveness in fire situations.

The results began to be reflected by insurers (rates and requirements), and specifications for sprinklers began to appear. In **1878**, there were no telephones, airplanes, or electronic communications, but the reputation of sprinklers and their record were growing.

Over 200,000 sprinklers were installed between **1878** and **1882**, and innovations grew with the burgeoning market. The Providence Steam and Gas Pipe Company adopted the first 'pipe schedule system' in **1878**. In **1879**, Grinnell patented the industry's first dry pipe valve, but the valve remained unpopular until refinements were made to the product in **1885**. By **1880**, Boston Manufacturers Mutual had adopted a formal pipe schedule for perforated pipe systems, and insurance companies were beginning to reduce rates to protected properties.

Henry Parmelee and Frederick Grinnell officially joined to manufacture sprinklers, and in **1881**, the Parmelee system was reported to be in use in 214 facilities. The sprinklers were reported to have controlled fires in nineteen locations between 1877 and 1881. The year **1881** also found Frederick Grinnell patenting the first 'sensitive' automatic sprinkler. The design incorporated some of the features of today's automatic sprinklers – a ½ inch orifice and a tooth-edged deflector. The new design was also more sensitive, and the ½ inch orifice was less apt to clog in flow conditions. The ½ inch orifice was a far larger waterway than 1/10 inch holes in perforated pipe! In **1882**, the Providence Steam and Gas Company introduced the Grinnell Model A sprinkler.

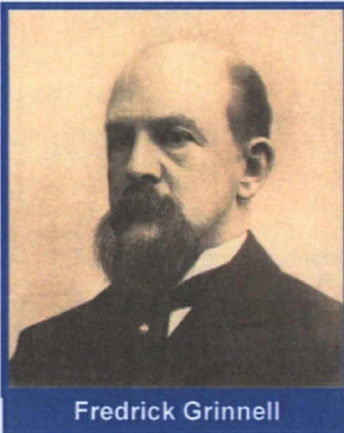


Ad for "Modern" Grinnell



## History of Sprinkler Systems

In **1883**, Sir William Mather visited Frederick Grinnell in Providence, Rhode Island. Mather, of England, acquired the rights to the Grinnell sprinkler for the Eastern Hemisphere, including Europe, Australia, and India. Mather was one half of the famous Mather and Platt combination that remained instrumental in European fire protection until their acquisition by Wormald (of Australia) in the early 1980's. Through Mather's efforts, sprinklers today continue to be referred to as "le Grinnells" in France.



Fredrick Grinnell

Factory Mutual began testing sprinklers in **1884**, and records show a total of eighteen different types of sprinklers being available. The first recorded sprinkler report was also published that year. In **1885**, Grinnell patented a 'bellows' differential dry pipe valve, and John Wormald of England wrote the first sprinkler installation rules. **1886**

found the establishment of UL, and Factory Mutual adopted sprinkler installation rules one year later, in **1887**. The industry had become international in scope, and codes and insurance were recognizing the importance of fire protection.

The 'English'-style alarm valve was developed by Providence Steam and Gas and General Fire Extinguisher in **1888**. It became the first widely used alarm valve in the industry, and by **1891**, the first of the Grinnell glass disc sprinklers was sold. The sprinkler became a standard and was in distribution through 1935. The sprinkler was formally approved by Factory Mutual in 1897.

The year **1893** was somewhat monumental for both Grinnell and Star. Frederick Grinnell consolidated the Providence Steam and Gas Company with Neracher and Hill Sprinkler Company of Warren, Ohio to create and incorporate the General Fire Extinguisher Company – one of the founding names of the National Automatic Sprinkler Contractors Association. In the same year, William Esty founded the Esty Sprinkler Company (later to become Star Sprinkler) in Laconia, New Hampshire.

Two years later, in **1895**, in response to complaints of improper installations, the National Fire Protection Association was founded by Frederick Grinnell and representatives of five insurance companies. The initial membership was comprised of twenty rating organizations and inspection bureaus. The NFPA was formed in Boston in **1896**, standards for the installation of automatic sprinklers written, and the first NFPA standard issued by the Committee on Automatic Sprinklers. Three additional committees were appointed one year later to address sprinklers; fire doors, shutters, and wire glass; and hose and hydrants. By **1899**, through the efforts of the newly formed NFPA, installation requirements for sprinklers had become somewhat uniform throughout the United States and Canada.

### The Turn of the Century – The Evolution of an Industry

By **1901**, Grinnell and Esty had become names in the industry. UL began the testing and listing of sprinklers, and fire sprinkler fitters unions were formed in Chicago and St. Louis. The year **1903** was a tragic year in which 170 died in the Rhodes Opera House fire in Boyertown, PA, and the Iroquois Theater fire in Chicago claimed 602 lives. Today's Minneapolis Sprinkler Fitters' local 417 was also established.

**1905** saw the historic meeting in St. Louis at which the National Automatic Sprinkler Contractors Association was formed. That same year, records show seventy-seven pages of the NFPA record being devoted to ongoing debates over sprinklers. The  $\frac{3}{4}$ , 1, 1-1/4 pipe schedule for three sprinklers was adopted by NFPA and became a standard that was used until the formal NFPA elimination of  $\frac{3}{4}$  inch steel pipe in 1940.

The early 1900's were a time of transition for the industry. Sprinkler fitters local 183 was formed in **1906**, followed by the Kansas City local and the first published "NFPA Quarterly" in **1907**. The year **1909** saw sprinklers installed in a school in Buffalo, New York for the first time.

Fire tragedies continued, as the Triangle Shirtwaist Fire in New York City claimed the lives of 145 people in **1911**. Despite the growing popularity of sprinklers with building owners and insurance carriers, the bulk of the nation's industries remained largely unprotected. By **1913**, a study showed that after 38 years of fire sprinkler installations, only five people had been killed in fires in sprinklered properties. That year saw a formal Life Safety Code being established by the NFPA.



Contact us on the Web at: [www.tyco-fire.com](http://www.tyco-fire.com) for more information.



## History of Sprinkler Systems

At a meeting at the Congress Hotel in Chicago in **1914**, the National Automatic Sprinkler Contractors Association formally changed its name to the National Automatic Sprinkler Association. At that meeting, committees were formed by the Association to work with both Underwriters Laboratories and Factory Mutual. That same year saw sprinklers being installed for the first time on seagoing vessels. Grinnell sprinklers were installed on both the 'Imperator' and 'Vaterland' of the Amerika Lines.

Local 669 Road Sprinkler Fitters Union (as we know it today) was formed in **1915**, and one year later, NFPA began "Fire News" as a member newsletter. In **1919**, General Fire



Extinguisher formally became Grinnell Corp. and UL published its first "Standard for Automatic Sprinklers". That same year, after studies had shown that many sprinkler failures were a result of improperly closed valves, the NFPA adopted a standard for valve supervision.

The NFPA created a separate standard for 'Class B' systems in **1930**, and UL recognized and listed the 'Junior System'. Light Hazard and 'open sprinkler' Extra Hazard classifications appeared for the first time in the NFPA code. The Grinnell "Duraspeed" sprinkler, a staple in the industry through the early 1990's made its introduction in **1931** (patented in 1932) – the same year in which tests showed quartzoid bulb sprinklers to be more heat sensitive than their solder link counterparts. In **1933**, the NFPA issued its first guide to fire departments regarding the use of fire sprinkler systems.

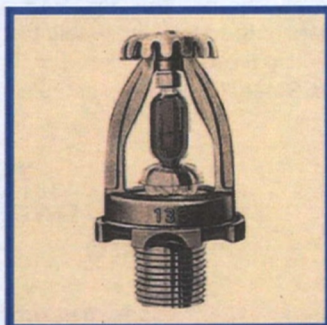
Special Hazard systems, much as we know them today, were pioneered by the introduction of the Grinnell 'Mulsifier' nozzles in **1935**. The nozzles were designed for flammable liquid applications, and are still offered in the Grinnell design today. Consolidated Edison in New York pioneered the use of water spray for transformer protection that year when a system was installed at their Hells Gate Station. In **1940**, responding to the use of water spray systems, the NFPA issued a standard on spray nozzles and extinguishing systems. One year earlier (1939) saw the NFPA adoption of a standard on the Care and Maintenance of Sprinkler Systems. The industry was beginning to evolve into today's fire protection.



### The Roaring 20's through the 30's - Laying Foundations for Today's Industry

One year later, in **1920**, the first quick opening device was developed by Grinnell Corporation. The quick opening device was followed one year later by Grinnell's release of the first Quartzoid sprinkler.

Star Sprinkler Company came into existence in **1923**, and was founded by T. Seddon Duke. **1925** heralded an NFPA standard on piping systems for fire protection, and National Fire Prevention Week was instituted two years later.



### The War Years and Beyond – the Fire Protection Effort Continues

Tragedy strikes Boston in **1942** at the Coconut Grove Nightclub when 492 people are killed in a fire. The National Automatic Sprinkler Association formally became the "National Automatic Sprinkler and Fire Control Association" in **1944**. One year later, the first Grinnell "Quartzoid" sprinkler was listed by UL. That same year, indifferent to an ongoing war effort, fire killed 119 people at the Winecoff Hotel in Atlanta.

Following the war, in **1947**, the National Automatic Sprinkler and Fire Control Association appointed a fact finding committee. This committee evolved into the Engineering and Standards Committee that continues to be respected throughout the industry today.







## History of Sprinkler Systems

Within the NFPA, the standards were revised to permit hydraulically calculated systems, and a sub-committee was appointed to develop a residential sprinkler standard. The industry was beginning to look more and more as it appears today, and foundations were laid for change.

Within the NASFCA, in **1974**, separate Contractors and Manufacturers councils were formed. In **1975**, a residential standard, NFPA 13D was adopted – one year after the creation of the United States Fire Administration. Despite the growing industry, the Beverly Hills Supper Club fire in **1977** in Southgate, Kentucky killed 165 patrons and workers.

Edward Reilly was elected president of the NASFCA in **1978**, and a new industry magazine, "FPC" was published for the first time. That same year, with interest in a new market segment growing, the United States Fire Administration began a residential fire test program in conjunction with Factory Mutual.

In **1979**, Central Sprinkler bought the Meyertech Corp., manufacturers of a quick connect style fitting, only to sell the acquisition to Grinnell Corporation. INA sold Star Sprinkler Company to Chemetron, adding fire sprinklers to the gaseous systems and alarm and detection capabilities of Chemetron. The names of Central, Grinnell, and Star continued to be focal points of the industry.

### The 80's and Beyond –

In **1980**, concerns for life safety initiated the Omega Residential Research project under the guise of the United States Fire Administration (Harry Shaw) with major involvement of Central Sprinkler Company. That same year, Grinnell achieved the first listing for a residential sprinkler (the Model FR-1). Central would follow with residential sprinkler listings one year later. With Life Safety efforts and research escalating in **1980**, fire deaths again made headlines when the MGM Grand fire in Las Vegas killed 85 guests and workers. The fallout of the tragedy would drive one of the nation's first fire sprinkler retrofit ordinances for high rise buildings.

In **1983**, the NASFCA formally changed its name to the National Fire Sprinkler Association, or the NFSA, as we all know it today. Central Sprinkler advertised the first horizontal sidewall sprinklers for residential use, and Grunau purchased Star Sprinkler from Chemetron. That same year, Star introduced its PH-3 Institutional Sprinkler, a product that became, and still is, the industry standard for standard response institutional sprinklers.

Factory Mutual began research on a product that would be known throughout the industry as the ESFR sprinkler, and the NFPA divided Extra Hazard occupancies into two separate classes – as they exist today.

In **1984** John Viniello was elected to the presidency of the NFSA. That same year, the NFSA publication that all members receive today – "Grass Roots" – was printed and distributed for the first time. Another presidency was also changing – Bill Meyer stepped down as the president of Central Sprinkler Company (but remained as the CEO), and his son, George Meyer, assumed his father's leadership role. That same year, Grunau/Vogel consolidated the manufacturing of fire sprinklers, valves, and devices under the 'Star' name. Star then proceeded to pioneer sales to independent distribution within the fire protection industry – key to the success of Star. Destined to become the product of choice in residential and retrofit applications, the first B.F. Goodrich – "BlazeMaster®" systems were installed in **1984**.

One of the major headlines in **1986** dealt with the deaths of 97 people at the DuPont Plaza Hotel in San Juan, Puerto Rico. Never making a major headline, Tyco acquired Grinnell Supply Sales and Manufacturing that year. One year later, Factory Mutual issued its first set of guidelines for the use of ESFR sprinklers for the protection of rack storage, and, under mounting pressure, BOCA adopted codes calling for the use of fire sprinklers in multi-family structures.

In **1988**, the industry's first Factory Mutual approved ESFR sprinkler was introduced to the market by Grinnell. Mixing storage and office disasters, the Safeway Warehouse and Interstate Bank fires that year had the same effect in California that the MGM Grand had in Nevada – California enacted retrofit ordinances, and the sprinkler industry geared for the Los Angeles high rise retrofit business. As retrofit high-rise fire sprinklers were being installed in California and Nevada, a fire killed 87 people at a sprinklered property in New York City – the Happy Land Club. The results of an investigation showed that the sprinkler system was improperly designed and installed. One year later, in **1991**, a fire in the One Meridian Plaza high rise in Philadelphia resulted in the deaths of three firefighters. The response was the same as had been experienced in Nevada and California – Philadelphia enacted a high rise retrofit ordinance. The pattern is very clear – sprinklers work, and deaths drive changes to building codes.

The industry's first ELO (Extra Large Orifice) sprinkler was pioneered and introduced by Central Sprinkler Company in **1992**. Grinnell followed in **1993** with the introduction of the industry's first 'residential shut off valve' – a device that effectively diverts all water supply to the fire protection system in the event of a fire sprinkler activation in a residential application.



## History of Sprinkler Systems

That same year, the NFPA recognized the emergence of water mist technology and established a technical committee for it.

The NFPA celebrated its 100<sup>th</sup> birthday in **1996**, and the annual convention in Boston drew the highest attendance figures of any other U.S. fire sprinkler show in history. Grinnell exhibited its first low pressure, water mist nozzles at that show – the AquaMist series – for flammable liquids, light and ordinary hazard, and marine (shipboard) applications. History was also being made within the industry, as Tyco International acquired Star from Grunau, applications. One year later, in **1997**, Star introduced its new 'Stealth' concealed sprinkler – twenty-six years after introducing the industry's first concealed sprinkler.

In **1999**, Central Sprinkler Company was acquired by Tyco International, giving Tyco three of the industry's oldest and most recognizable brand names – Central, Gem, and Star. The acquisition completes what was almost historically eerily meant to be – without tie to fire protection. The Grinnell R&D facility in Cranston, Rhode Island, is the site of a former foundry that produced cannon balls during the Civil War. In Lansdale, the home of Central Sprinkler Company for many years, the old structure once housed a foundry in which cannons were produced for the same war effort. Through the fire protection industry, the sites of the brands that once produced cannons and cannon balls for a Civil War, have been brought together by Tyco International.

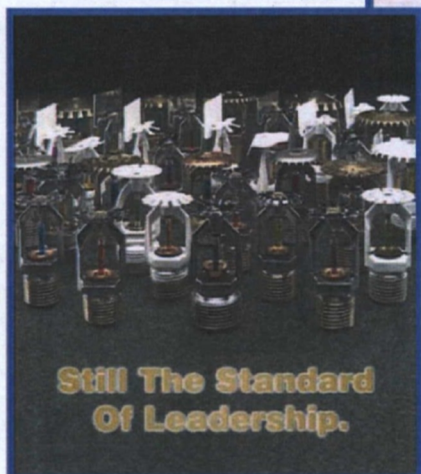
The industry's first Extended Coverage sprinkler for storage was introduced by Tyco Fire in **2000**.

The past five years have seen added changes within the industry. Codes continue to evolve through the efforts of the NFSA and its members, more retrofit ordinances have been passed, and residential sprinklers are now common in multi-family dwellings, as well as in many single family homes where communities such as Scottsdale, Arizona, and Addison, Texas have recognized their importance in saving lives and property.

**2003** saw another horrific nightclub fire in Warwick, Rhode Island where 100 people were lost. This fire inspired immediate changes to the standards for occupancy protection.

Technology continues to advance, and, if anything, fire sprinkler protection is more affordable than ever before. Through it all, the NFSA, Central, Gem, and Star continue to be linked in their efforts to improve fire safety.

Central, Gem, and Star are proud to have played a large part in the industry's history and wish the NFSA another 100 years!



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**CHALLENGES HAVE CHANGED...**

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## Remember State Fire Marshal, Your VRP Statistics Are Attached ...

Your state's Voluntary Replacement Program Statistics are attached to this Newsletter. The Statistics for the VRP are state and Program specific. You may distribute these statistics or this newsletter to your constituents. We encourage you to pass along the information contained in this newsletter and the positive progress that is being made in the VRP.

## Fire Sprinklers Never Sleep – Success Stories

### 1– Fire Sprinklers Save Macy's

An item on the Los Angeles NBC 4 TV station on December 6, 2004, said, a fire apparently sparked by overheated machinery in an elevator control room at the Glendale Galleria triggered a fire sprinkler that doused the flames, authorities said.

The fire was reported about 11:35 p.m. Sunday night on the second floor of the Macy's store at the shopping mall, said Glendale fire Captain Carlos Guerrero. No injuries were reported. The fire was out by the time firefighters arrived.

The flames were confined to the control room containing the motor that powers the elevator, and did not involve the elevator or the elevator shaft, he said.

Fire crews vented the building and drained off the water, and the store was able to open for business.

*Reprinted from FPC Magazine*

### 2– Sprinklers Control Hotel Fire

Washington— four sprinklers controlled an unintentional fire in a large hotel ballroom, limiting damage to the building and alerting the fire department.

The wood frame hotel, which measured 200 feet (61 meters) by 100 feet (30 meters), had a flat, built-up roof supported by wooden trusses and covered with asphalt and tar. The unoccupied ballroom was protected by a wet-pipe sprinkler system, as was the attic above it.

A 911 call from a passerby at 9:56 p.m. alerted firefighters to a column of smoke coming from the hotel ballroom. The call was followed shortly afterwards by a call from the monitoring company, reporting a water flow alarm.

Responding fire crews noted light-colored smoke coming from a corner of the ballroom roof when they arrived on the scene, and the incident commander sent a ladder and engine crew to the roof to locate the source



As firefighters began opening the roof near an HVAC unit, interior crews pulled down ceilings located at the seat of the fire.

Sprinklers in the concealed space were keeping the fire under control, but attic insulation blocked some of the water spray, allowing the blaze to continue burning. Eventually, the entire space was opened from the ceiling to the roof, and the fire was extinguished.

Investigators determined that the rooftop heating equipment was involved in the ignition of the hotel's framing materials, but they couldn't determine the exact ignition sequence.

Damage to the building, valued at approximately \$15 million, was estimated at \$100,000. Damage to its contents was estimated at \$60,000. There were no injuries.

*Reprinted from NFPA Journal*

### 3– Blind Man Saved By Sprinklers

In an article in the *King County Journal* on October 1, 2004, a blind resident of Peter's Creek Retirement Home was saved early on September 30, 2004, when overhead sprinklers put out a fire on his bed.

Redmond Fire Investigator, mark Pease, said the fire was started by an electric blanket on the man's bed. The fire burned through a two-foot-square area at the foot of the mattress while the man slept. It was only when the fire sprinklers activated that the man woke up and made his way out of the room and into the hallway. He was unaware of the fire until the firefighters told him.

The fire on the mattress had been nearly extinguished by the sprinklers. Redmond fire codes require retirement homes and other commercial buildings larger than 3000 square feet to have sprinklers. Without sprinklers, the fire could have threatened the entire facility, which had 69 residents.

*Reprinted from FPC Magazine*